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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Jun Minakuti

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EXAMINER

QUIETT, CARRAMAH J

ART UNIT

PAPER NUMBER

2622

MAIL DATE

DELIVERY MODE

07/11/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/773,882	Applicant(s) MINAKUTI ET AL.	
	Examiner Carramah J. Quiett	Art Unit 2622	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 March 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 and 10-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 and 10-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. The amendment(s), filed on 03/07/2008, have been entered and made of record. Claims 1-8 and 10-20 are pending.

Response to Arguments

2. Applicant's arguments with respect to claims 1-8 and 10-20 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
4. **Claims 1-8, 10-16, 18, and 20** are rejected under 35 U.S.C. 103(a) as being unpatentable over Sano (U.S. Pat. 6,184,940) in view of Shinotsuka (U.S. Pat. 6,191,408) and Skow (U.S. Pat. 6,995,791).

For **claim 1**, Sano discloses an image-sensing apparatus (fig. 1) comprising:

a solid-state image sensor (ref. 101; col. 2, lines 14-55; col. 3, lines 17-51) including:

a plurality of pixels that perform photoelectric conversion (col. 3, lines 35-36; col. 5, lines 13-16) so as to generate output signals that vary with a first characteristic (long color signal) in a first region and with a second characteristic (short color signal) in a second region (high-brightness area) with respect to amount of incident light (col. 2, lines 14-55; col. 3, lines 17-51); and

a white balance circuit (refs. 130/140) that performs white balance processing by performing, on at least one of different types of chrominance signals outputted from the solid-state image sensor, different calculation operations fit respectively for the first and second characteristics in the first and second regions so as to thereby generate new output data (col. 4, line 15 -- col. 5, line 55; fig. 2).

However, Sano does not expressly teach the image sensor including a first characteristic in a first region such that the output signals vary linearly with respect to the amount of incident light and with a second characteristic in a second region such that the output signals vary logarithmically with respect to amount of incident light, a plurality of types of color filters provided in vicinity of the pixels; and chrominance signals outputted as corresponding to the different types of color filters.

In a similar field of endeavor, Shinotsuka discloses a first characteristic in a first region such that the output signals vary linearly with respect to the amount of incident light and with a second characteristic in a second region such that the output signals vary logarithmically with respect to amount of incident light. Please read col. 6, lines 21-36. In light of the teaching of Shinotsuka, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the image sensor of Sano with the first characteristic and the second characteristic as recited in claim 1 in order to correct variations in characteristics between pixels of an image sensor.

In a similar field of endeavor, Skow discloses an image-sensing apparatus comprising an image sensor (fig. 1, ref. 110) including a plurality of types of color filters provided in vicinity of the pixels; and chrominance signals outputted as corresponding to the different types of color

filters (col. 5, lines 32-56; col. 6, lines 23-25; col. 8, lines 24-30). In light of the teaching of Skow, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the image sensor of Sano with color filters in order to provide white balance for a Bayer Pattern digital image for use in various applications (Skow, col. 5, lines 32-56).

For **claim 2**, Sano, as modified by Shinotsuka and Skow, discloses an image-sensing apparatus as claimed in claim 1, wherein the first region is located on a lower-brightness side of the second region, and the output signals vary more greatly with the first characteristic than with the second characteristic with respect to the amount of incident light (Sano, col. 3, lines 17-30).

For **claim 3**, Sano, as modified by Shinotsuka and Skow, discloses An image-sensing apparatus as claimed in claim 1, wherein the white balance circuit performs the white balance processing by performing different calculation operations in at least three brightness regions, namely a region in which all types of chrominance signals represent the first characteristic, a region in which all types of chrominance signals represent the second characteristic, and a region in which at least one of the different types of chrominance signals represents the first characteristic and at least one of the different types of chrominance signals represents the second characteristic (Sano, col. 2, lines 14-55; col. 3, lines 17-51; Skow, col. 6, lines 23 -- col. 7, line 2; col. 11, lines 40-61).

For **claim 4**, Sano, as modified by Shinotsuka and Skow, discloses an image-sensing apparatus as claimed in claim 1, wherein the white balance circuit performs the white balance processing by, assuming that one of the different types of chrominance signals is a first chrominance signal that serves as a reference and another of the different types of chrominance signals is a second chrominance signal, performing a calculation operation on the second

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chrominance signal so as to make a photoelectric conversion characteristic thereof identical with a photoelectric conversion characteristic of the first chrominance signal (Sano, col. 5, lines 4-55; fig. 2; Skow, col. 6, lines 23 -- col. 7, line 2; col. 11, lines 40-61; figs. 1 and 4).

For **claim 5**, Sano, as modified by Shinotsuka and Skow, discloses an image-sensing apparatus as claimed in claim 1, wherein a switching point at which the output values of all the types of chrominance signals switch between the first and second regions is identical (Skow, col. 11, lines 40-61 and col. 12, lines 19-28).

For **claim 6**, Sano, as modified by Shinotsuka and Skow, discloses An image-sensing apparatus as claimed in claim 1, wherein the white balance circuit has a look-up table in which are previously stored calculation results of the calculation operations so that the white balance processing is performed by generating the new output data of the different types of chrominance signals by using the look-up table (Skow, col. 6, lines 23 -- col. 7, line 2; col. 11, lines 40-61).

For **claim 7**, Sano discloses an image-sensing apparatus (fig. 1) comprising:

a solid-state image sensor (ref. 101) including:

a plurality of pixels that perform photoelectric conversion (col. 3, lines 35-36; col. 5, lines 13-16) so as to generate output signals that vary with a first characteristic in a first region and with a second characteristic in a second region with respect to amount of incident light (col. 2, lines 14-55; col. 3, lines 17-51); and

a white balance circuit (refs. 130/140) to perform white balance processing on different types of chrominance signals outputted from the solid-state image sensor (col. 4, line 15 -- col. 5, line 55; fig. 2),

However, Sano does not expressly teach the image sensor including a first characteristic in a first region such that the output signals vary linearly with respect to the amount of incident light and with a second characteristic in a second region such that the output signals vary logarithmically with respect to amount of incident light, a plurality of types of color filters provided in vicinity of the pixels; and a white balance circuit having a first look-up table in which is stored information with which to perform white balance processing on different types of chrominance signals outputted as corresponding to the different types of color filters from the solid-state image sensor, wherein the first look-up table provides, as output data, signal levels that are corrected, relative to levels of input chrominance signals, for deviations among the different types of chrominance signals in such a way as to correspond to the first and second regions.

In a similar field of endeavor, Shinotsuka discloses a first characteristic in a first region such that the output signals vary linearly with respect to the amount of incident light and with a second characteristic in a second region such that the output signals vary logarithmically with respect to amount of incident light. Please read col. 6, lines 21-36. In light of the teaching of Shinotsuka, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the image sensor of Sano with the first characteristic and the second characteristic as recited in claim 1 in order to correct variations in characteristics between pixels of an image sensor.

In a similar field of endeavor, Skow discloses an image-sensing apparatus comprising an image sensor (fig. 1, ref. 110) including a plurality of types of color filters provided in vicinity of the pixels (col. 5, lines 32-56; col. 6, lines 23-25; col. 8, lines 24-30); and

a white balance circuit (refs. 120-140) having a first look-up table in which is stored information with which to perform white balance processing on different types of chrominance signals outputted as corresponding to the different types of color filters from the solid-state image sensor (col. 6, lines 23 -- col. 7, line 2; col. 11, lines 40-61),

wherein the first look-up table provides, as output data, signal levels that are corrected, relative to levels of input chrominance signals, for deviations among the different types of chrominance signals in such a way as to correspond to the first and second regions (col. 6, lines 23 -- col. 7, line 2; col. 11, lines 40-61). In light of the teaching of Skow, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the image-sensing apparatus of Sano with the image-sensing apparatus, as recited in claim 7, in order to provide white balance for a Bayer Pattern digital image for use in various applications (Skow, col. 5, lines 32-56).

For **claim 8**, Sano, as modified by Shinotsuka and Skow, discloses an image-sensing apparatus as claimed in claim 7, wherein the first region is located on a lower-brightness side of the second region, and the output signals vary more greatly with the first characteristic than with the second characteristic with respect to the amount of incident light (Sano, col. 3, lines 17-30).

For **claim 10**, Sano, as modified by Shinotsuka and Skow, discloses an image-sensing apparatus as claimed in claim 7, wherein the first look-up table provides output data that correspond to at least three brightness regions, namely a region in which addition and subtraction are performed among signal levels of the chrominance signals, a region in which multiplication and division are performed among signal levels of the chrominance signals, and a region in which addition/subtraction and multiplication/division are performed on the chrominance

signals. Please read Skow, col. 8, lines 24-51; col. 10, lines 54-63; col. 11, lines 9-67; and see figs. 1 and 4.

For **claim 11**, Sano, as modified by Shinotsuka and Skow, discloses an image-sensing apparatus as claimed in claim 7, further comprising: an evaluation value calculation circuit that, assuming that one of the different types of chrominance signals is a first chrominance signal that serves as a reference and another of the different types of chrominance signals is a second chrominance signal, calculates, for each type of second chrominance signal, an evaluation value that indicates a relationship between a photoelectric conversion characteristic of the first chrominance signal and a photoelectric conversion characteristic of the second chrominance signal on a basis of a relationship between signal levels of the first and second chrominance signals fed from the solid-state image sensor, wherein the first look-up table provides the output data on a basis of the evaluation value and the photoelectric conversion characteristic of the first chrominance signal. Please read Sano, col. 5, lines 4-55; fig. 2; and Skow, col. 6, lines 23 -- col. 7, line 2; col. 8, lines 24-51; col. 10, lines 54-63; col. 11, lines 9-61; figs. 1 and 4.

For **claim 12**, Sano, as modified by Shinotsuka and Skow, discloses an image-sensing apparatus as claimed in claim 11,

wherein the evaluation value calculation circuit calculates the evaluation value on a basis of average values of the first and second chrominance signals, respectively. Please read Sano, col. 5, lines 4-55; fig. 2; and Skow, col. 11, lines 9-61; figs. 1 and 4.

For **claim 13**, Sano, as modified by Shinotsuka and Skow, discloses an image-sensing apparatus as claimed in claim 12, wherein the evaluation value calculation circuit calculates the evaluation value by calculating a first evaluation value on a basis of a relationship between

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average values of the first and second chrominance signals respectively as varying with the first characteristic, calculating a second evaluation value on a basis of a relationship between average values of the first and second chrominance signals respectively as varying with the second characteristic, and adding together the first and second evaluation value with weights. Please read Sano, col. 5, lines 4-55; fig. 2; and Skow, col. 6, lines 23 -- col. 7, line 2; col. 8, lines 24-51; col. 10, lines 54-63; col. 11, lines 9-61; figs. 1 and 4.

For **claim 14**, Sano, as modified by Shinotsuka and Skow, discloses an image-sensing apparatus as claimed in claim 13, wherein the evaluation value calculation circuit sets the weights with which the first and second evaluation values are added together on a basis of a relationship between number of pixels that output signals that vary with the first characteristic with respect to the amount of incident light and number of pixels that output signals that vary with the second characteristic with respect to the amount of incident light.

For **claim 15**, Sano, as modified by Shinotsuka and Skow, discloses an image-sensing apparatus as claimed in claim 7, wherein the information in the first look-up table is updated according to variation of a relationship among the signal levels of the different types of chrominance signals. Please read Sano, col. 5, lines 4-55; fig. 2; and Skow, col. 11, lines 9-61; figs. 1 and 4.

For **claim 16**, Sano, as modified by Shinotsuka and Skow, discloses an image-sensing apparatus as claimed in claim 7, wherein a switching point at which the signal levels of the chrominance signals outputted from the solid-state image sensor switch between the first and second regions is variable (Skow, col. 11, lines 40-61 and col. 12, lines 19-28), and

the information in the first look-up table is updated according to variation of the switching point at which the signal levels of the chrominance signals switch between the first and second regions (Skow, col. 11, lines 40-61 and col. 12, lines 19-28).

For **claim 17**, Sano, as modified by Shinotsuka and Skow, discloses an image-sensing apparatus as claimed in claim 7, further comprising:

a second look-up table that, assuming that one of the different types of chrominance signals is a first chrominance signal that serves as a reference, has, as input addresses, signal levels of the first chrominance signal and provides, as output data, signal levels having processing other than the white balance processing performed thereon Skow, col. 11, lines 40-61 and col. 12, lines 19-28).

For **claim 18**, Sano discloses an image-sensing apparatus (fig. 1) comprising:

a solid-state image sensor (ref. 101) including:

a plurality of pixels that perform photoelectric conversion (col. 3, lines 35-36; col. 5, lines 13-16) so as to generate output signals that vary with a first characteristic in a first region and with a second characteristic in a second region with respect to amount of incident light (col. 2, lines 14-55; col. 3, lines 17-51); and

a white balance circuit (refs. 130/140) with which to adjust a white balance among different types of chrominance signals outputted from the solid-state image sensor (col. 4, line 15 -- col. 5, line 55; fig. 2),

wherein signal levels having white balance processing and processing other than the white balance processing performed thereon (col. 4, line 15 -- col. 5, line 55; fig. 2).

However, Sano does not expressly teach the image sensor including a first characteristic in a first region such that the output signals vary linearly with respect to the amount of incident light and with a second characteristic in a second region such that the output signals vary logarithmically with respect to amount of incident light, plurality of types of color filters provided in vicinity of the pixels; and a white balance circuit having a look-up table in which is stored information with which to adjust a white balance among different types of chrominance signals outputted as corresponding to the different types of color filters from the solid-state image sensor, wherein the look-up table provides, as output data, signal levels having white balance processing and processing other than the white balance processing performed thereon.

In a similar field of endeavor, Shinotsuka discloses a first characteristic in a first region such that the output signals vary linearly with respect to the amount of incident light and with a second characteristic in a second region such that the output signals vary logarithmically with respect to amount of incident light. Please read col. 6, lines 21-36. In light of the teaching of Shinotsuka, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the image sensor of Sano with the first characteristic and the second characteristic as recited in claim 1 in order to correct variations in characteristics between pixels of an image sensor.

In a similar field of endeavor, Skow discloses an image-sensing apparatus comprising an image sensor (fig. 1, ref. 110) including a plurality of types of color filters provided in vicinity of the pixels (col. 5, lines 32-56; col. 6, lines 23-25; col. 8, lines 24-30); and

a white balance circuit (refs. 120-140) having a look-up table in which is stored information with which to adjust a white balance among different types of chrominance signals

outputted as corresponding to the different types of color filters from the solid-state image sensor (col. 6, lines 23 -- col. 7, line 2; col. 11, lines 40-61),

wherein the look-up table provides, as output data, signal levels having white balance processing and processing other than the white balance processing performed thereon (col. 6, lines 23 -- col. 7, line 2; col. 11, lines 40-61). In light of the teaching of Skow, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the image-sensing apparatus of Sano with the image-sensing apparatus, as recited in claim 7, in order to provide white balance for a Bayer Pattern digital image for use in various applications (Skow, col. 5, lines 32-56).

For **claim 20**, Sano, as modified by Shinotsuka and Skow, discloses an image-sensing apparatus as claimed in claim 18, wherein the look-up table provides, as output data, signal levels having white balance processing and gain adjustment processing for exposure control performed thereon. Please read Sano, col. 5, lines 4-55; fig. 2; and Skow, col. 11, lines 9-61; figs. 1 and 4.

5. **Claim 19** is rejected under 35 U.S.C. 103(a) as being unpatentable over Sano (U.S. Pat. 6,184,940) in view of Shinotsuka (U.S. Pat. 6,191,408) and Skow (U.S. Pat. 6,995,791) as applied to claim 18 above, and further in view of Sano et al. (U.S. Pat. 6,972,800).

For **claim 19**, Sano, as modified by Shinotsuka and Skow, discloses an image-sensing apparatus as claimed in claim 18, wherein the look-up table provides, as output data, signal levels having white balance processing (Sano col. 4, line 15 -- col. 5, line 55; Skow, col. 6, lines 23 -- col. 7, line 2; col. 11, lines 40-61);

In a similar field of endeavor, Sano et al. discloses gradation conversion processing performed thereon (fig. 1, ref. 8; col. 7, line 63 – col. 8, line 1). In light of the teaching of Sano et al., it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the image-sensing apparatus of Sano with the image-sensing apparatus, as recited in claim 7, in order to provide contrast thereby improving the dynamic range performance (Sano et al., col. 1, lines 24-27; col. 7, line 63 – col. 8, line 1).

Conclusion

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Carramah J. Quiett whose telephone number is (571)272-7316. The examiner can normally be reached on 8:00-5:00 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, NgocYen Vu can be reached on (571) 272-7320. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Carramah J. Quiett/
Examiner, Art Unit 2622
July 7, 2008

*/Ngoc-Yen T. VU/
Supervisory Patent Examiner, Art Unit 2622*